

- [141] T. Schnitzler, K. Kohls, E. Bitsikas, and C. Pöpper, “Hope of Delivery: Extracting User Locations From Mobile Instant Messengers,” in *30th Annual Network and Distributed System Security Symposium, NDSS 2023, San Diego, California, USA, February 27 - March 3, 2023*, The Internet Society, 2023.
- [142] Mozilla, “Protections Against Fingerprinting and Cryptocurrency Mining Available in Firefox Nightly and Beta ,” 2019.
- [143] F. Cohen, “Computer Viruses: Theory and Experiments,” *Comput. Secur.*, vol. 6, no. 1, pp. 22–35, 1987.
- [144] P. Kocher, D. Genkin, D. Gruss, W. Haas, M. Hamburg, M. Lipp, S. Mangard, T. Prescher, M. Schwarz, and Y. Yarom, “Spectre Attacks: Exploiting Speculative Execution,” *meltdownattack.com*, 2018.
- [145] M. Schwarz, C. Maurice, D. Gruss, and S. Mangard, “Fantastic Timers and Where to Find Them: High-resolution Microarchitectural Attacks in JavaScript,” in *Financial Cryptography and Data Security - 21st International Conference, FC*, vol. 10322, pp. 247–267, 2017.
- [146] G. J. Duck, X. Gao, and A. Roychoudhury, “Binary Rewriting Without Control Flow Recovery,” in *Proceedings of the 41st ACM SIGPLAN International Conference on Programming Language Design and Implementation, PLDI*, pp. 151–163, 2020.
- [147] J. D. Seideman, *Transformation and Abstraction to Aid Comparison of Binary Executables Across Compilation Environments*. PhD thesis, City University of New York, 2023.
- [148] H. Huang, A. M. Youssef, and M. Debbabi, “BinSequence: Fast, Accurate and Scalable Binary Code Reuse Detection,” *Proceedings of the 2017 ACM on Asia Conference on Computer and Communications Security*, 2017.
- [149] J. Jang, A. Agrawal, and D. Brumley, “ReDeBug: Finding Unpatched Code Clones in Entire OS Distributions,” in *2012 IEEE Symposium on Security and Privacy*, pp. 48–62, 2012.
- [150] H. Jang, K. Yang, G. Lee, Y. Na, J. D. Seideman, S. Luo, H. Lee, and S. Dietrich, “QuickBCC: Quick and Scalable Binary Vulnerable Code Clone Detection,” in *ICT Systems Security and Privacy Protection*, pp. 66–82, 2021.
- [151] S. Srikant, S. Liu, T. Mitrovska, S. Chang, Q. Fan, G. Zhang, and U. O’Reilly, “Generating Adversarial Computer Programs using Optimized Obfuscations,” in *9th International Conference on Learning Representations, ICLR 2021, Virtual Event, Austria, May 3-7, 2021*, OpenReview.net, 2021.

- [152] H. Ye, M. Martinez, X. Luo, T. Zhang, and M. Monperrus, “SelfAPR: Self-supervised Program Repair with Test Execution Diagnostics,” in *37th IEEE/ACM International Conference on Automated Software Engineering, ASE 2022, Rochester, MI, USA, October 10-14, 2022*, pp. 92:1–92:13, ACM, 2022.
- [153] W. Zhang, S. Guo, H. Zhang, Y. Sui, Y. Xue, and Y. Xu, “Challenging Machine Learning-based Clone Detectors via Semantic-preserving Code Transformations,” *IEEE Trans. Software Eng.*, vol. 49, no. 5, pp. 3052–3070, 2023.
- [154] A. Nicholson, Q. Stiévenart, A. Mazidi, and M. Ghafari, “Wasmizer: Curating WebAssembly-driven Projects on GitHub,” in *2023 IEEE/ACM 20th International Conference on Mining Software Repositories (MSR)*, pp. 130–141, 2023.

**Part II**

**Included papers**



# WEBASSEMBLY      DIVERSIFICATION FOR MALWARE EVASION

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**Javier Cabrera-Arteaga**, Tim Toady, Martin Monperrus, Benoit Baudry  
*Computers & Security, Volume 131, 2023*

<https://www.sciencedirect.com/science/article/pii/S0167404823002067>

# WASM-MUTATE: FAST AND EFFECTIVE BINARY DIVERSIFICATION FOR WEBASSEMBLY

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**Javier Cabrera-Arteaga**, Nick Fitzgerald, Martin Monperrus, Benoit Baudry  
*Submitted to Computers & Security, under revision*

# CROW: CODE DIVERSIFICATION FOR WEBASSEMBLY

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**Javier Cabrera-Arteaga**, Orestis Floros, Oscar Vera-Pérez, Benoit Baudry,  
Martin Monperrus

*Network and Distributed System Security Symposium (NDSS 2021), MADWeb*

<https://doi.org/10.14722/madweb.2021.23004>

# MULTI-VARIANT EXECUTION AT THE EDGE

---

**Javier Cabrera-Arteaga**, Pierre Laperdrix, Martin Monperrus, Benoit Baudry  
*Conference on Computer and Communications Security (CCS 2022), Moving  
Target Defense (MTD)*

<https://dl.acm.org/doi/abs/10.1145/3560828.3564007>



# SUPEROPTIMIZATION OF WEBASSEMBLY BYTECODE

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**Javier Cabrera-Arteaga**, Shrinish Donde, Jian Gu, Orestis Floros, Lucas Satabin, Benoit Baudry, Martin Monperrus

*Conference Companion of the 4th International Conference on Art, Science, and Engineering of Programming (Programming 2021), MoreVMs*

<https://doi.org/10.1145/3397537.3397567>

# SCALABLE COMPARISON OF JAVASCRIPT V8 BYTECODE TRACES

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**Javier Cabrera-Arteaga**, Martin Monperrus, Benoit Baudry

*11th ACM SIGPLAN International Workshop on Virtual Machines and  
Intermediate Languages (SPLASH 2019)*

<https://doi.org/10.1145/3358504.3361228>